Notebook Series -- Notebooks by Edison
Notebook, N-12-07-29

This notebook was used during the period July-August 1912 and also in December 1912. All entries are by Edison. The entries from the summer of 1912 pertain primarily to the transfer and pressing processes involved in disc record manufacture. They describe experiments with various methods of preparing Condensite varnish surfaces and culminate in a list of eight steps in the process of pressing disc records. Edison's notes indicate that Edward L. Aiken, Jonas W. Aylsworth, H. Grimes, Sherwood T. (Sam) Moore, and Frederick P. Ott assisted him in some instances. There is one reference to notes entered into "Book B," probably N-12-07-28. Also included is a series of entries on "instrument tests" that describe the sound quality and volume of recordings made with individual string and wind instruments. Entries from December relate to the electroplating involved in disc record manufacture and include experiments on plating molds with electrolytic deposits of nickel, gold, and copper, as well as notes on the structure of the plating tank. There is also a comment on Edison's work habits. Inserted into the book are three related notes by Edison, including one from January 14, 1913, addressed to Ott. The front cover is labeled "A." The pages are unnumbered. Approximately 65 pages have been used.

July 29 1912

Experiments on getting quiet surfaces —

No 86 Transfer good no flaws — but the surface is full lumps — Millimin — fingers need refeels them

Thick as this —

Evidently transfers must be smooth. no use having transfers like this you they will pop up in the record

This record has very little de surface when we first put it on it showed worse, but this was a white stuff which was shaved off by the diamond apparently it floated on varnish or stuff coming it was out considerable but after varnishing with varnish it was better — used Pantaros Zephyr No Knox think now and so on Mond (Letters it is)

fills OK – looked streaky before washing has this

There is increased

pressed connection Pantaloon Zipper but
focus prior out seams are blurred
stuff – Scratch is pretty fair
Except at stand but entirely good
much clean print 1015 mond

pretty fair stuff –

Aiken Number –

87 acts like go but no white stuff comes off. No cracks. Primer buffed the master (no rouge) but run out scratch so still in it Zephyr. Notice 2 or 3 light red spots – This stuff moulds good – the roughness is in the master mould

This number is a great improvement over No 90 & 86 – No snaps, columns scratch appears to be made up of fine cracks

Transfer 1 good
One has fine cracks at Edge &
3 bad spots 1015 Zephyr

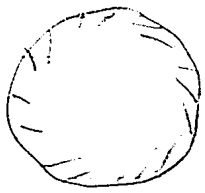
Acken 88

No cracks, run out concentricity
other side scratch less than in
87+90 or 86 Run out much
louder Big hole in transfer
didn't clean up paint pulled off -
on mould
No white stuff — Its clean
The Roughness in the mould

	Rough		not rough

The square clean place in Zephyr
shows in all records —

Transfer has cracks at Edge 1/2" long



89 Aiken

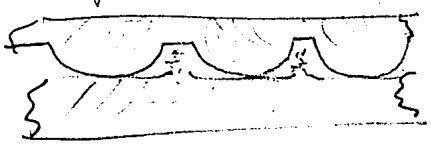
Dust comes out turns over outer part of record, it looks black — Cracks in outer Edge Big holes where chiff has stuck to mould Cracks on start along

The transfer very bad, Cracks at Edge on running one inch & place showing light color stuck to mould | Thes Number is 119 — Buffed moved Zephyr 1015

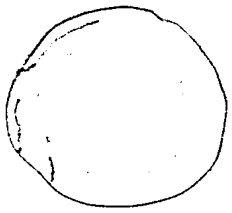
Transfer Cracked from Edges bad & big opats one big chunk Came off

Aiken 90 -

This is worse than 86 - Surface nearly everywhere coated with whitish yellow - it comes out of the transfer. It is on the side walls - When diamond goes over it shaves it off in long hairs — it squeezes out of the transfer & runs upon into the bridges



This record is all crinkled at Edges



No snaps -

It also sticks to mould in bridges & bead at come off = this number has peculiarity of sticking to mould & cracking as well & also letting liquid separate out

Transfer I very good another full flowing cracks at Edge

Aeken 91 Is very good [I hear no harmonics or unequal I don't]
Surface is good — It has Penta decoloration — it must be very soft,
Its No 1 Yellow Varnish with 20% of Penta To 100 Resin - Reg penta —
No Naphthalene however — Had few small bubbles after baking
Has come round a little on 92 but not raised up — they don't come

92 Acken

Not so good surface as 91
has scraped up round & spots all
over record = Moore packed them
says soft jelly like =
5% less Ponta (10) 15% not
emulted quite as much as 91

93 Acken

Has very good surface & can't hear run out = imagine I don't hear harmonics — It's not smoothed as much as 91 & 92 This is pretty good If all records were as good as this I would press them for our fair

10th/o Penta — Scarcely any of the little round spots in this —

Made a Dup & it was bad — This shows our transfers, baking & pressing is where the trouble is — Even if we get a perfect record the next one may be very bad —

94 Aiken —

Little more cracks surface on this at start & all thru ~~[illegible]~~ its only fair

5% Penta — Lots little round spots - some are in record grooves + close cracks, shows long cracks nearly closed up but not quite, Evidently transfer was cracked wow not fully closed up on pressing record — dirt oozed out of cracks at middle + shows in a spot

Record appears dirty —

In inner smooth part there are several very bad cracks —

95 Acker

Smutted – Dont look good

Torn at Edges – Weaker big

Cracks run out – near center

very quiet

30% Pentz – Very large Cells

round spots very conspicuous

& numerous – Wrinkled at Edge

& Tapes generally none –

This shows our present grower

weaker bad flour culminating

of the softening ingredients –

~~[illegible]~~

86 Best
87 Not so good
88 Corner
89 Dirt comes out from Cracks
big run out — Not good

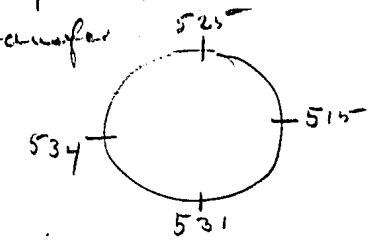
90 surface Coated nearly all over with stiff cement and shave off to white hair

Transfer

86 Transfer best
87 1 good 1 bad
88 Transfer Cracked all around Edges radically
89 " " + big bad spots
90 1 good 1 very bad

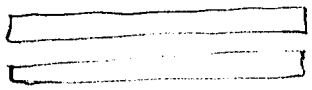
Calliper of 1200 lb pressed

transfer



Thickness

Grumes double blank

1st 

Raw powder blank pressure 500 Lbs
100 lbs steam heat -

2nd These are baked 3 hours at 220
@ 290

3rd Two put together no varnish between
pressed 500 Lbs with heat of steam at
100 Lbs - It flows out against Taper
ring

4th. Varnish face one side only with
2 Coats varnish

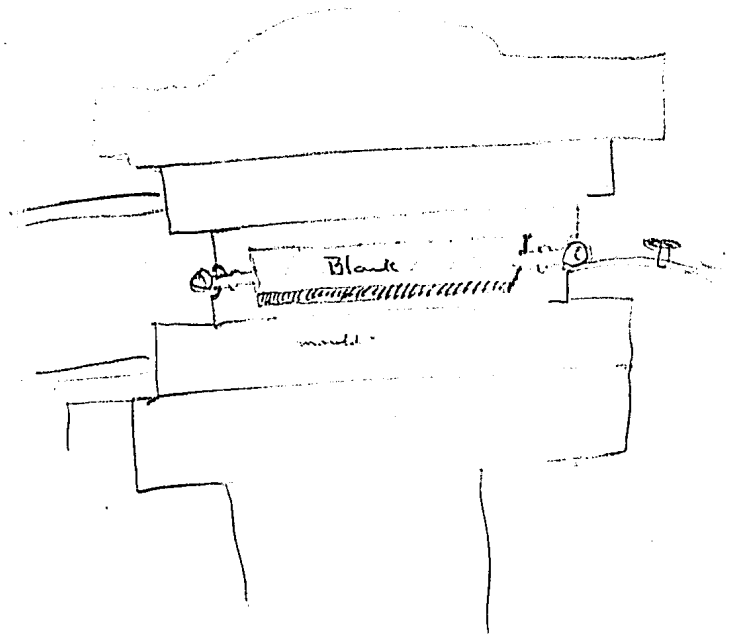
5th Bake 4 at 140 Fahr 2 To 4 hours

6th Reprees varnished side against
smooth Monel at 1500 Lbs

7th – Varnish again with one coat + bake again at 140 °F for 2 hours

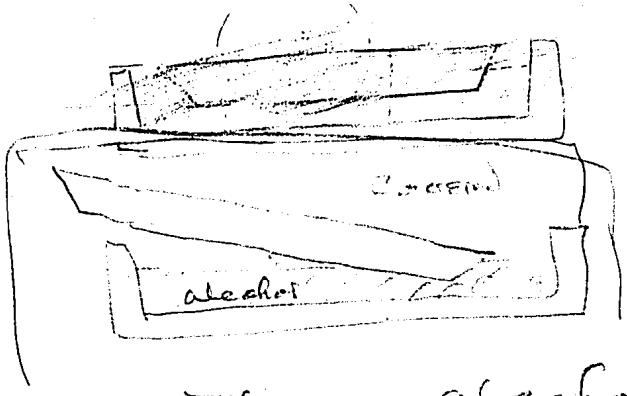
8 = Put in press + put transfer on at 1200 lbs with 100 lbs steam heat, 3'

Thus ends the Operations of making Grumes plates with 12 Coat Transfer



Moore suggests put cold coolant in Top plate & ~~Coat~~ put on coolant & Same time Cool off steam from bottom plate but use no coolant instead of suddenly Chilling The Condensate at the required

Others put 1/2 of a Record in Alcohol



2 months in — alcohol
all Evap —
found that the top half
of record had very numerous
blisters fully as wide as track
hundreds done in track & look
as if they could sound records
on Reproducing gives big
dull Crackles of very loud

Some Thus

Moore suggests weekend pert
transfer in with Ice cream —
Perhaps Gremin Can do it
or Than Chicken Can finish
at 1200 with Vace —

Arkon No - 21 - Little more scratch than Reg = Using tracked Record —

No 22 shade more than reg

No 74 - Shade more quiet than Reg

83 - slightly better than Reg

79 = Better than Reg — Reg only Reason being 10 Foot

36 - better for contour scratch + has less snaps than Reg

72 smoother & less snaps than Reg — = alph Nap

77 Very much better than Reg + lowest Contour + few snaps all of better is no mould — of Course the mould itself has a run out

37 - only moved swaps smoother than Reg

Para Nitro Chloro Cresol 6 grams
4/10 6/4

44 Louder Coulomm than Reg

49 Aken Beat = Dehy Resin 100
Phenol 15
6/4 9 8/10

Alcohol 120 - DE -

122 grams of above added to the Dichlorocresol 6 grams
6/4 4/10 grams -

Grumes put brass ring around ~~Blank~~ so blank could not flow = Used a new tracked blank — No 1 Vanished

This is the nicest cleanest Record we Ever had — effect & good around Edges No burnt ~~edge~~ (No 1 Burnt quite). The surface was good but there was lots of snaps

These snaps are due to fine holes & when the molecules of brass & Tacker record act a lot of MUCK comes up there these holes & over flows on the record, this makes the Snaps —

The no flow idea is good & we will adopt it —

Notice on one record or regular parlor that something comes over edge + gives a big grunt,

Grunts says there are openings in the solder + when he deps the mould in Patarch solution it runs in — If this is true that this grunt is patarch it should when water is put on it + rubbed with a rag chew big cavities from attack the Conkerada — I tried it)

It does leave great deep cavities, Grunts is right + we must use rag + not get KOH on edges

I took a rag Pouched record
No 1 Varnish put RCH on it
all over, then put water
on & rubbed with a rag
& finally was well with
water & dried at 120 in
oven for 1/2 hour —
I then had a new record
pressed in it, all the holes
closed up O hole closed
all except a thin line some more
crescent shaped line — There was
no improvement in surface

Note for Aiken

If the coat of varnish that is to stick transfer on is not hardened + much segregates out when transfer is pressed + then over flows round through holes

Why not use varnish with no mack in just plain resin in alcohol -

If it is not segregated much that comes up then those holes get the unhardened varnish itself - Then in that case why not hold it in press at 100 lbs heat until it is hardened so cant flow out -

How long will it take, to harden at 100 lbs steam heat so it cant flow

S S S

If too long in press hurt transfer surface then the sticking varnish could be given a double dose or more of 6/4 so it would harden within the regular time 1 or 2 min -

S S

Moore said when he made Cowal Records
he noticed that when he felt outside ring
it appeared to be cold but when he
took out the record the center of Record
was so hot he couldnt hold his
hand on it — This of course
will never produce a record or
a train for that wont be cooled

Submasters taken out of press
feel cold in a minute while laying
down they get hot - because
they have not been cooled
all through —

Best -

Dups of 93 with variation
only of MCN 15% normal

Clarkan 96 = fine transfer
no cracks no fine pimples -
Extra good -
Dup of 93 but with 25 MCN
in

Clarkan 97 - 20% MCN
Looks fine - Even fewer than 96 -
in one place a slight separation underneath
faint shad of fog

Clarkan 98 MCN - 10% BEST
see very small pimples no amnt looks even
better than 97 No fog.

5%
Clarkan 99 = shade fog
not pronounced like 98 97 Ele
more cracks or flaws - no black where

Clarkan 100 - Cracked - badly.
fogged little
not good

Retrial of 4 Varnishes
of 7100 that looked good - put
but grams plates

No 101 = 2245 - slightly more free phenol
than in Reg No 1 No Cracks
fog spots small, pitting for
very slight small pimples

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102 aniline - 6 grams Benta
to Reg No 1

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103 — Monochromap 3 grams
all cracked edges

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104 aniline 3 grams benta added
full pimples - smut spots, few small
cracks -

99 after Varnish 1011 Record

Even all over no run out, surface very small + OK with horn 3 flaw no flaws no run out —

12 Coat transfer = didnt have ring but there was very small flaw —

97 = Cracked, but its not the Varnish

The blank itself is cracked all way thru. bad surface on inside smooth part,

The Scratch is very small probably less than 99 - but not much, in weak part with horn Edge 3" from drill Count hear it

96 = bad Crackles on start
scratchy all the way thru
probably due to flow —

98 = generally more scratchy than
97 + 99 =
Think the scratch is proportionate to
the flow — this simply flowed more
than 99 + 97 = had flow been
practically nothing all would
probably be good —
in 98 there is a hole & stuff
has come up & flowed along
the groove —

Old punta-broaked mould healed
225 fahr & grafted little bits came
up slow — second brighter but are
apparently flat & not as clear they
are varied. The reason had up
smutted all over & scratchy
bad run oils of Every Kind
& 99 Evidently heat up out
at 12 coat Crazy

Burnt in 2 pieces.

New Varnish healed 2.2.4
grafted — stars OK, smooth
all through but contracts
to the land = This healing
process with grafting wax
not do must get rid of it
altogether & confine the flow to
impressing the record in only

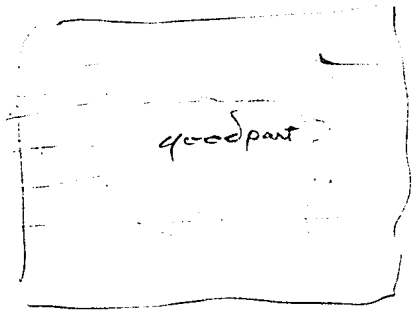
Aug 3rd 1912

Grimes made a working mould
1011 - from a Transfer with No 1 Varnish
& a print from that —

It is satisfactory scratch only
shade more than sub master
print —
Evidently No 1 Varnish
stands the vacuum & must
be substituted for Penta Varnish
Record ~~Would~~ looks clean polished —
When gold plating is right
proper think it will
be OK —

Experiments Fred did, with 2" square white wax grafted in Satter press against a mandrel all pressure it could stand —

Dont office at 140 Fahr 1/2
" 160 " 3/4



outside part flower cracks

Fred is making a ring to mill from the white material to it put it in hot + pressing — then cooling

Several discs calipered
Each time a disc is
pressed to a ring it
shrinks 10/1000 on 10"
record,

platina used on 3 Records
.012 dia - aluminum
Calipered .011 - 46 inches used

90/1000 sqr for 3 Records

Tried CCC Effects on previously
Recorded in collitte work
are in Book ~~No~~ B

Reals of different instruments
in Orchestra by hearing it play
Microscope

Annie Laurie French Horn

The tone is very impure, there is a
slight bremolo in it at one places.
+some Extra sounds, The pitch varies
very bad on sustained notes.
This is a very poor instrument
for pure tone.

Caution

Later I find Rhono Dont hold
pitch altho it has a big clear fly
wheel — I will get this fixed before
I go ahead —

Instrument Tests

~~1st Violin Regular~~

Viola — 5 inch away

[illegible] accomplishes here — overtones will be nearly all [illegible]

[illegible] Can it be that the player is not steady on low + cant make a steady Volume it Sounds OK on Tune but not on scale & notice [illegible] on scale not shown in tunes Essentially the Tune covers a lots of defects —

Tremando holds trembles when "bowing" + it trembles different as bow takes different position

French Horn

Annie Lawrence Foote

I hear knocks = The sustained notes are not perfectly even in volume but better than Viola — It is not particular sweet instrument its timbre changes from note to note

Horn 12 feet away —
Last note rather — timbre allowance overcentral scale, Wonderful Enormous unequalness in volume of sound in each note, a sort of tremolo not even in number, it might be called an unequal tremolo — Very unpure — + given hollow tone accompanying tones

7 9

Clarinet in B♭.

15" away from Horn

Rather steady – but 7 notes poor – + melodious clarinet + weak, Enormous change of volume & timbre at 11th note –
good timbre steady at 7th note, seems to be good up to highest, after 7th – There is a once unbreaking note OK in tune where one cannot detect,

Cornet in B♭

4 ft away

Scale is rank – on every note there are great volume changes.
The timbre changes on every note, only one pure note in the whole scale. The first two notes are wavy & this is true of the Clarinet & Violin first tested, its a little exaggerated by chopping reproducer just before 1st note comes the Sylvia ~~[illegible]~~ seem to throw a wave in relation of Cylinder —
The unequality of the sustained notes come sensically as notes & with the time. It is a very poor instrument when heard in Scale
Crude & raw —

1st Regular Violin -

5" away from Horn

Somewhat irregular in volume but better than Viola high notes pretty good except least more noise than music —

Trombone

4 ft away

2 changes in timbre
& a stumble at one place
Power on volume than
French Horn much
better than Cornet.
its more even in volume than
Even the Violin - The 3
lowest notes not much - party-
blubbery — Very even on the
tune — Not bad instrument

Cello –

Key of G

Tune even above unequal

Volume of sustained notes

Strah Cello

Scale –

labels must have been
changed this last sound
like a Cello –

Very unequal Volume

Flute —

15" away

Somewhat unequal in volume.

in Tune Notice Enormous Change of Volume from one note to another if the regular volume is represented by 100 the very next 2 or 3 notes it will drop to 25 in Volume then back to 100 & so on — This is a Rather peculiar one & it ought to be fixed

Tuba

Tiffany

Better timbre than Trombone
more overtones & family
peers in Volume

There is a blubber in one
note very noticeable in
[illegible]

Piccolo

15" away

Scale. Low much better than flute on high —

In the tune notice that violent volume change took place below the flute but this change not shown in scale —

The change is so great that it would fall from a clear sound to no sound at all & then go a little higher & appear again showing there are in flute a certain part of frequencies which player produces a volume 2 or 3 times less than it ought to go in the scale there is found a cancellation

Oboe

This gives best result

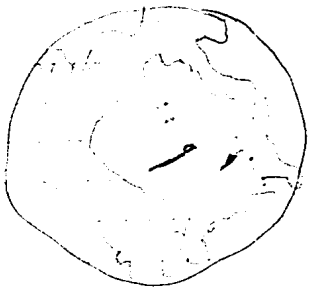
Even Volume, Scale of
all so far heard

at one place the Timbre changes
& Volume greatly increases
Its much softer than
flute, more like a
Clarinet in timbre
~~[illegible]~~ perhaps been
mistaken about this
instrument it dont
seem to be the kind of
instrument to give flute
squeeks as crafted.

No 1 Varnish.
Experiments in which only MCN was varied

No 1 15 MCN Reg

No 2 30 MCN —



Worst of all the series
yellow
smutted bad
no

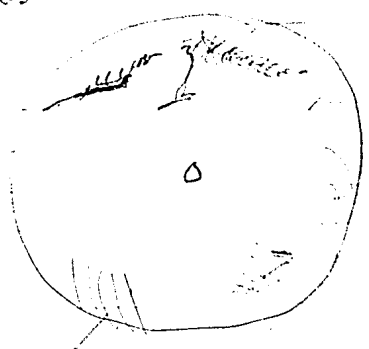
pitted all over deep, showing liquid
rising out + underground decay between plate
+ transfer – This shows MCN not wanted

2A 20 mcn —

5 — 10 mcn

yellow

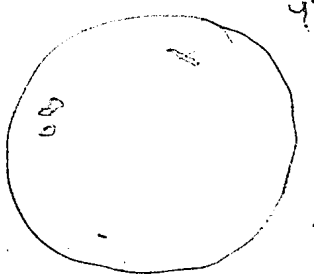
Very shiny surface



Cracks

Cracks no —

6 5 WCN — yellow



otherwise good
hasnt an dull
surface as 1707

No 1 Varnish all way from Sticking Varnish
125 B — Rough Blank varnished with it —

This was the best only one line near center where its raised & shows yellow streak — Unlike all the others it didnt shine but was dull, perhaps transfer plate was dull — WE pressed & tracked new Mould in 1st use of the mould, it has big Crackles on outer smooth part & 1/4 inch on Music — But we had previously Examined the mould & found these Crackles are in the Mould, Canary bird wings — all the Crackles are fully developed

for in the mould had that been perfect the record would have been very good surface — the shade lockdown commencer thank have heard hear it OK with hand on ear with faint cracking hear nothing with hand off ear after get in 1/4 inch from start of track — there isn't a snap in it If this can be duplicated into the Best transfer for us ~~[illegible]~~ ~~[illegible]~~ — Looks very clean & outside smooth part looks also extremely clean

The Canadian band comes out due to gray on plating either first covering of gold but more probable in the nickeling

There are several mountain or long range up ~~[illegible]~~ —

0 No 125 – B Blanks – is cementing Varnish which is No 1 Varnish

12 Coat Transfer
No 1 Varnish –

Very bad Crackles – Cracks +
Hills – Exceedingly bad record

Hills

Cracks –

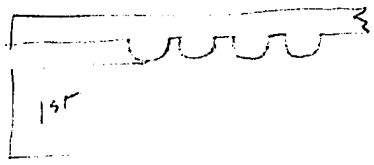
Ditto 12 coat No 1 Varnish
125 – B Blank –

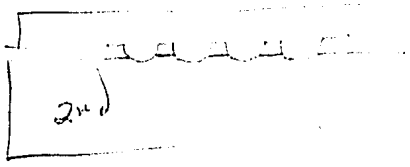
Hills – few Cracks Cracks 4:02
sharp Crackles hills dull soft but
Loud – NG

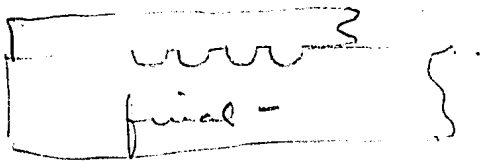
Want Ackers Number for
the above –

Process — now — [illegible] 11 1912

1 Put mould in
2 Leave in Vac 3 mins
3 Have press 340 & pull mould in
4 bring to Control of 3 mins
5 put on 40 lbs pressure 6 mins
6 then put on full pressure 1 min
7 Turn off vacuum put in contact for 1 minute, then break Vac. Keep contact on 9 mins
8 = Take pressure off & pull mould — pressure — pressure gradually off [illegible]



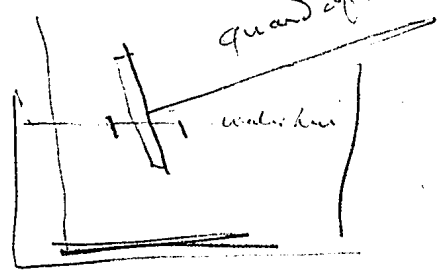




Dec 31 1912

Expts on Plating disc

Conical Moulds

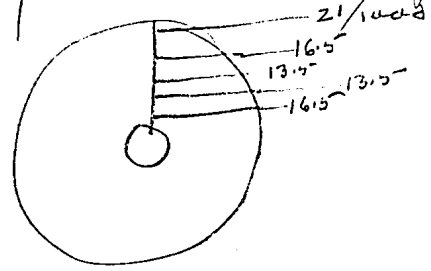


10 Rev Min —

18½ hours average

12 average

Calyx of Cu



Nothing distinctly
the guard lots of black
specks collecting & collecting
from almost Cu get on
& poor plated in —

Must have rubber cover
on part exposed or under
to immediately detach
these specks — also
must clean bath to
stop them falling in —

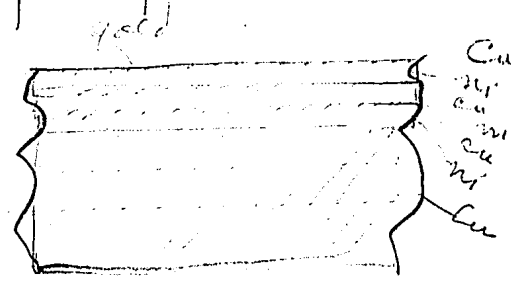
Dec 31 1912

Tried the idea of 1st plating Record
(gold) with Cu 1 min at 15 amp to
cover then for 2 hours at rate
of 80 milamp per inch in the
Gentman Nickel solution,
Dont crack or peel —

Think that can get .002 & then
possibly coat again with
Copper which is tough &
well prevent cracking

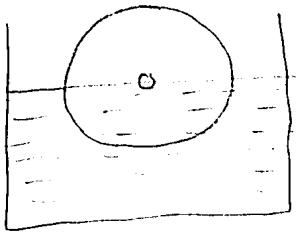
Dec 31 1912

possibly make a composite
record face of thick layers of
Ni & thin layer Cu
up to 14 or 15/1000 then all
Cu —
It would have many seconds
in this way —



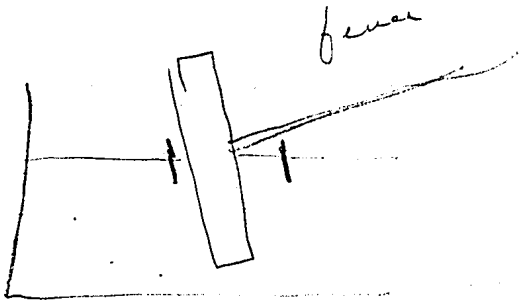
The gold & 1st layer Cu will
wear away by cleaning & then
the hard Ni will be the face
as the depth of wear is only
1/1000 the Cu is not more
than 1/100 of this it will
not effect the quality or
make it any rougher & we get
rid of the plating operation
which always brings in a few cracks

due to fact we must clean
the metal before electroplating
by this copy the cell done
at once —



The new plating cell is a peach
Rotating the second 1/2 out
of liquid 1/2 in & rotating
10 Rev min has many
advantages all the bubbles
break & dewdrops as the 1/2 part
comes out of liquid into the
air — This removes the
air bubble trouble —

Also by putting a fence



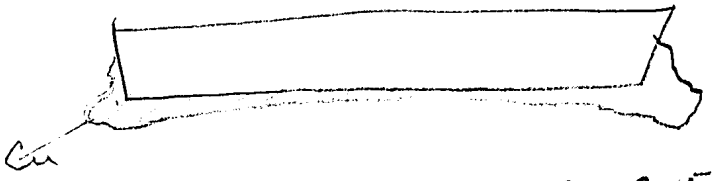
so to speak around the disc
The dirt held up on the surface
of the whole cell is not
pulled down & plastered on
face of second only a very
little flow on & that only as
evaporated in the fence

By means of a wiper of
soft rubber on the part
exposed to the air all the
dirt is kept off & the
particles get no chance to
stick & be plated in the
copper —

Dec 31 1912

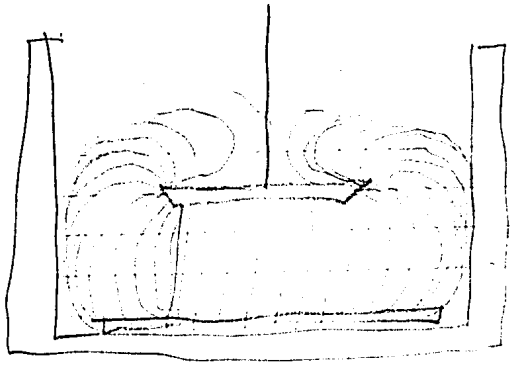
I cannot find in any of the Electrolytic plating books where they have got rid of heavy deposits on edges. We have tried a great number of devices but so far not successfully

the second when it comes out the bath is thus

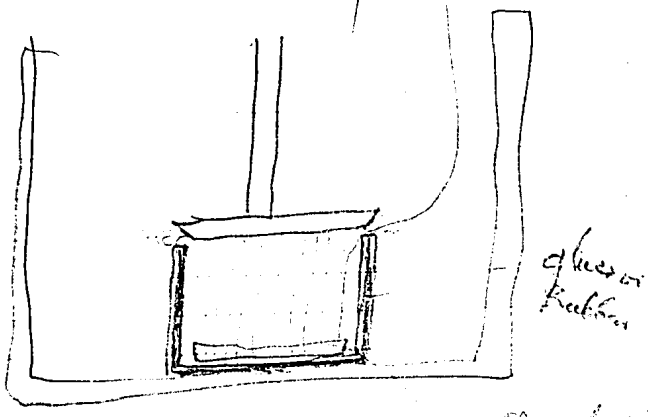


I find on thinking it over that the long plating is done it could not help occurring

& I am making new tank to work on this principle

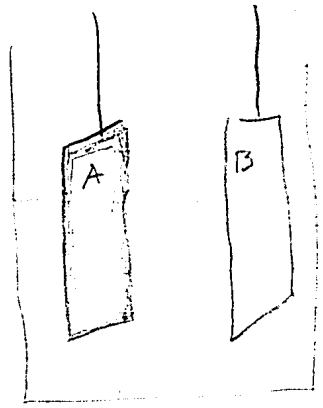


Old & usual way



This principle is used in plating I think —

Just tried the Composite adhesive



A Cathode of sheet Ni B Ni Anode
Cathode is painted around back & Edges so acc plating takes place on flat where it will easily strip (acc) + nothing to anchor it,

First put on 400 Ml amp in Cu sol for 10 sec then covered then put in Ni bath for 2 hours at 100 Ml amp

The surface Exposed one inch — It adhered strongly showed no signs of peeling at Edge — the Cu holding it down in Contact —

Used German Ni Salts.

Sol —

Stripped it & it Crackepeared

1.1/4 / 1000

It showed many pores round warts, but would go to 2 1/2 @ 3/1000 before could see matter of fact super adjoint Chunk it would peel Even then —

Think with 2/3rd this density of Current + the same amount of first Flash of Copper + can get 2 1/2/1000 Easy

then could put on 1/4/1000 Cu & put 2½/1000 more Ni on & do this 3 or 4 times & finally finish with all Copper —

the Ni is somewhat brittle

I now put 100 ma for 1 minute to coat blank of Copper on nickel cathode it covers it OK —

then put in Ni sol 100 ma about 1 @ 1¼ sq in each

Began on 36 min OK no peel

peeled at Edge — 40 minutes

Wants more Copper

probably 2 min at 100 ma —

Put new strip in, 100 ma 2 min in Copper

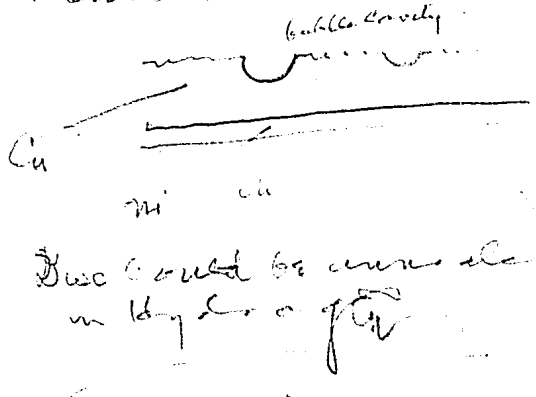
Then in Ni sol at 759 — at 845 not peeled
9 pm " "
9.30 " "

Everybody works but pulling am all alone in Lab making these Experiments the only man out of 4800 except the watchmen — in all the Works

Off 10 o'clock just started peeling at 10 - bottom Edge where its twice to 3 times thicker - put it in Copper 400 ma at 10 01 pm -
at 1045 fine grain Cu OK not peeled —
at 1045 increased to 800 ma
this is equivalent to 60 amp on a disc - as there is about 1½" Exposed in Cu Sol.

Stripped it to OK but of Gent
like Ni Cracks showing that
it must not be too thick say
1/2 ~~[illegible]~~/1000 + then a little Copper
alternative Cracks thick 1/2/1000
with 1/20 or 1/40/1000 Cu Bethanam
Enough Copper to OK a weak mat,
Cracks, lower density on Ni
may keep out H + make it less
brittle also heat of process
probably commercial,

800 ma on 1 1/2 inches gives
gram OK must be kept free
bubbles as I saw in number



Disc could be cross clad
in by dip or [illegible]

New Tank - Cu Coil - 67 Tabs -

Put in White (Brushed) blanks
Been plated in weak nickel
gold -
Put - Copper tank at
5 amp took second time to
cover & then only covered on
nickel - bad gold,

Put in Ni Bath for 12m
min at 6 amp -

had Tabs it not as could
started reading
Put in Cu bath at 545
15 amp -

There are a lot of whitish
looking spots on nickel
saw them on 1st Copper

9 brushed gold before
Covered only Can say
what these spots are
perhaps touch marked gold 60

as to more tender than
Condemnation —

1000,

46.000 41.400-

$\frac{460}{10}$ $\frac{4600}{100}$

5- .2

10 amp min -

15 -
6 %

46 - 15 -
60
90

-90

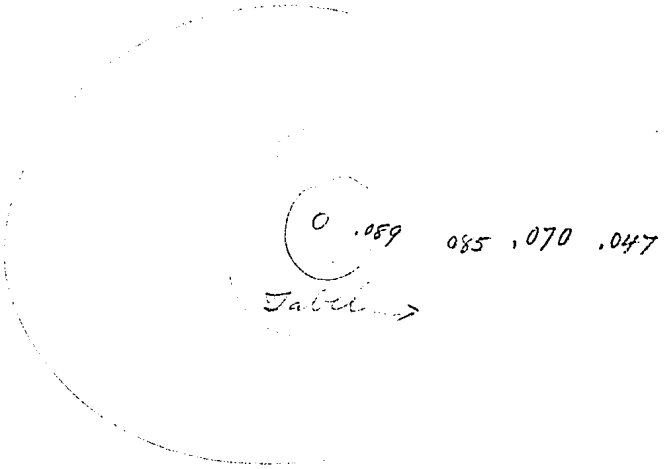
46
90
-414

[ITEMS(S) FOUND IN BOOK]

Fred Ott - Neams 1/14/13

Graft Then Gold —
Didnt cover quad on Edges, started
Covering in Center 1st Strange —
~~Started~~ Covered over whole surface
.3 mm Except near Edges had to run it
for 20 minutes to get it over Edges
& make a clench for the Ni, while
most of Edge was ok in 7 min
has center plug in —
Transferred to Ni 6 amp
22½ min — 135 amp min. fine
no peel, transferred to Cu bath
at 9.50 pm — at 953 10
amp — at 955 15 amp for
all night,

[ITEMS(S) FOUND IN BOOK]



[ITEMS(S) FOUND IN BOOK]

n No. 706

NATIONAL PHONOGRAPH CO.

When referring to this bill
Mention this Number

YOUR ORDER NO.

OUR ORDER NO.

TRAFFIC DEPT. NO.

ERMS 30 DAYS NET.

SOLD TO

NOTICE—Please do not Alter the Figures on the Bill. If any Errors or Differences exist, kindly return for Correction, so as to avoid Confusion of Accounts.

We do not insure delivery or safe carriage of goods. They are at your risk of breakage and transportation after shipment from our factory.

Remit direct to Orange, N. J. Office.

No Salesmen have Authority to Collect our Accounts.

SHIPPED TO

VIA:

ORANGE, N. J.,

AGES	GROSS WEIGHT	LBS.

[ITEMS(S) FOUND IN BOOK]

In Copper of main G camp —
dedrit Cover with leaves & one pebble
at Edge dedrit Cover at left

Put in M 9 numbers as in
their place M' attached peat

Took out peat in Cop at
10.07. 15T camp —

[ITEMS(S) FOUND IN BOOK]

6 amp-

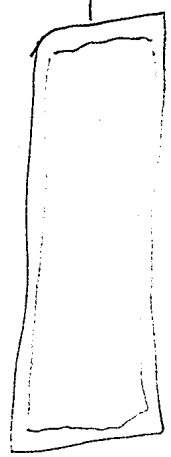
903 20 min

118 amp minutes

925 6 amp

off 947½ 22½ min

135 amp minutes



225
6
135